University of Gdańsk

Subject card

Subject name and code	AI in Data Analysis, PG_00204633						
Field of study	Informatics and Econometrics						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		5.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Department of Econometrics -> Faculty of Management -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Anna Zamojska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	30.0	0.0	0.0	60
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	60		4.0		61.0	125
Subject objectives	The course aims to show the various AI methods used in data processing and analysis and their application in practice.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[IiEMU2_W10] Possesses a deeper understanding of the essential dilemmas of modern civilization, particularly concerning the IT development	The student knows and understands the limits of artificial intelligence in data analysis. He knows the need to supplement his knowledge in this area constantly.	[SW2] presentation/project/paper/ report
[IiEMU2_W08] Possesses a comprehensive understanding of the methods, conditions, directions, and dilemmas involved in applying advanced econometrics, informatics or statistics tools in response to dynamic environmental changes	The student applies advanced AI tools with their advantages and disadvantages. Performs robustness analysis of the obtained results with modification of the model resulting from environmental changes.	[SW2] presentation/project/paper/ report
[IiEMU2_U06] Can utilize structured and detailed knowledge of management, quality sciences, economics, and finance to address dilemmas and develop innovative solutions for complex or unusual problems that arise in professional settings	The student implements the basic tools of artificial intelligence in data analysis and justifies the application of the selected AI model in practice. The student prepares complex solutions to unusual problems and recognises the future consequences of the implemented solutions.	[SU2] presentation/project/paper/ report
[IiEMU2_W03] Possesses a thorough understanding of how organizations operate, including the complex phenomena, processes, and relationships that exist in their environments and how these impact their functioning	The student adapts the AI tools used in data analysis to the structure of the organisation under study and its interaction with the environment.	[SW2] presentation/project/paper/ report
[IiEMU2_U03] Is able to obtain and verify data from properly selected sources and to collect, process, and visualize it using modern econometrics, informatics or statistics tools	The student creatively analyses the acquired data, compares it with existing theories, and proposes new solutions. Then, the student clearly and communicatively presents the results of the analyses in verbal and written form.	[SU2] presentation/project/paper/ report [SU5] implementation of a problem task

Subject contents

1. History of artificial intelligence. Main assumptions.
2. Directions of research on learning and problem solving under deterministic conditions.
3. Directions of research on learning and problem solving under uncertainty.
4. Evaluation of historical and contemporary views on the functioning of artificial intelligence.
5. Ethical problems in the application of artificial intelligence.
6. Introduction to machine learning (Machine Learning):

- supervised learning (Supervised Learning) (solving regression and classification problems)
- Unsupervised Learning (Unsupervised Learning) (cluster analysis algorithms, anomaly and novelty detection, visualization and dimensionality reduction)
- Semisupervised learning (Semisupervised Learning)
- reinforcement learning (Reinforcement Learning) (passive, active learning)
- natural language processing (Natural Language Processing)

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Project	51.0%	100.0%

Recommended reading

Basic literature

1. Russell, S., & Norvig, P. (2021). Artificial Intelligence: A Modern Approach, Global Edition (4th ed.). Pearson Higher Ed.
2. Daniel Jurafsky, James Martin, Speech and Language Processing. An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition, Second Edition, Prentice Hall, 2008.
3. Steven Bird, Ewan Klein, and Edward Loper (2009). Natural Language Processing with Python. O'Reilly Media. ISBN 978-0-596-51649-9 3.
4. Mining Text Data, Charu C. Aggarwal, ChengXiang Zhai, Springer, 2012
5. Christopher D. Manning, Hinrich Schütze, Foundations of Statistical Natural Language Processing, MIT Press, 2000.
6. Emmanuel Roche, Yves Schabes, Finite-State Language Processing, MIT Press, 1997.

Supplementary literature

1. Kwartalnik Computational Linguistics i materiały konferencji organizowanych przez ACL (Association for Computational Linguistics). Dostępne przez http://acl.ldc.upenn.edu/ ACL Anthology.
2. Reinforcement Learning: An Introduction. Richard S. Sutton and Andrew G. Barto Second Edition, in progress MIT Press, Cambridge, MA, 2017

eResources addresses

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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